

# THE MINERAL INDUSTRY OF TUNISIA

By Philip M. Mobbs

The Tunisian minerals industry was dominated by the production and processing of crude oil, the mining of phosphate rock, and the manufacturing of phosphate-based fertilizer products. The gross domestic product (GDP) based on purchasing power parity valuation of this 163,610-square-kilometer North African nation was estimated to have been about \$70.1 billion<sup>1</sup> in 2003, compared with \$65.5 billion in 2002. Based on current prices, the country's GDP was estimated to be \$25.1 billion in 2003, of which natural gas and petroleum production accounted for about 2.7%; the chemicals and rubber sectors (which included the fertilizer industry), 1.9%; the building materials, cement, and glass sectors, about 1.7%; and mining, about 0.8%. The contribution of mining to the industrial sector increased slightly in 2003 compared with 2002, despite significant declines in barite and iron ore output (Central Bank of Tunisia, 2004, p. 56-59; International Monetary Fund, 2004<sup>2</sup>).

## Trade

According to the Central Bank of Tunisia (2004, p. 106), total Tunisian exports were valued at \$7.9 billion in 2003 compared with \$6.9 billion in 2002; however, higher international commodity prices that benefited some mineral sector exports were offset by increased costs of imported mineral commodities.

Europe absorbed 84.3% of Tunisian exports; the main destinations were France (32.5% of total exports), Italy (22.1%), and Germany (10.5%). Because of lower production, crude oil exports declined by 18% to about 18.6 million barrels (Mbbbl) in 2003 from about 22.5 Mbbbl in 2002, but the value of crude oil exports dropped only 3% to \$489 million in 2003 from \$504 million in 2002. Other mineral sector exports included phosphate-based fertilizers (\$341 million, up from \$289 million in 2002), refined petroleum products (\$300 million, up from \$139 million in 2002), phosphoric acid (\$121 million, down from \$151 million in 2002), cement (\$38 million, up from \$27 million in 2002), iron and steel (\$28 million, up from \$20 million in 2002), phosphate rock (\$25 million, down from \$32 million in 2002), and zinc (\$12 million, down from \$18 million in 2002) (Central Bank of Tunisia, 2004, p. 111, 113, 118, 122, 125).

The total value of imports for 2003 was more than \$10.7 billion. France (26% of total imports), Italy (20%), and Germany (9%) were the primary sources of imports. Imports of minerals and mineral-based products included refined petroleum products (\$764 million), iron and steel (\$324 million), crude oil (\$263 million), sulfur (\$100 million), natural gas (\$79 million), ammonia (\$78 million), and kaolin and other clays (\$10 million) (Central Bank of Tunisia, 2004, p. 111, 113, 118, 122, 125).

## Commodity Review

### Metals

**Iron and Steel.**—In 2003, the Société du Djebel Djerissa produced about 70% of its iron ore output from the underground Djerissa Mine and about 30% from the open pit at Tamera. Production declined about 20% from both mines compared with 2002, as they continued to deplete their ore reserves (Central Bank of Tunisia, 2004, p. 59).

Economic reasons forced the Government-owned steel plant, El Fouladh—Société Tunisienne des Sidérurgie, to close its blast furnace in May 2003. The furnace originally had been temporarily shut down for maintenance in November 2002. El Fouladh continued to produce steel in its 70,000-metric-ton-per-year (t/yr) electric arc furnace. In the processed steel sector, Intermetal S.A. commissioned its renovated 300,000-t/yr-capacity steel bar and section mill in Tunis in February and the European Investment Bank authorized a \$35 million loan for a 500,000 t/yr cold-rolling mill at Tunisacier's Biserta works (Metal Bulletin, 2003; Central Bank of Tunisia, 2004, p. 66; Danieli Group, 2003§; MESTeel.com, 2003§).

**Lead and Zinc.**—In 2003, Breakwater Tunisia S.A. (a subsidiary of Breakwater Resources Ltd. of Canada) milled 410,961 metric tons (t) of lead-zinc ore from the Bougrine Mine compared with 423,414 t in 2002. In 2003, Breakwater optimized the Bougrine mill's metallurgical performance with a reduction to a 5-day-per-week operations schedule from the previous 7-day-per-week schedule, which allowed the company to stockpile and subsequently blend ore from the mine. The Bougrine mine produced 64,036 t of zinc concentrates that contained 34,964 t zinc and 6,900 t of lead concentrates that contained 4,502 t lead in 2003 compared with 61,656 t of zinc concentrates that contained 33,706 t zinc and 6,859 t of lead concentrates that contained 4,565 t lead in 2002. Breakwater projected that the F-2 and F-3 ore zones at Bougrine would be depleted by early 2005. In 2003, to evaluate an additional source of ore for the mill, the company drilled the Bou Khil property. Breakwater also evaluated the possibility of converting the lead-zinc mill to a cement-clinker grinding mill (Breakwater Resources Ltd., 2004, p. 17).

Additional lead and zinc was mined by a Government-owned company, which produced about 1,800 t of zinc concentrates from the Fej Lahdoum Mine.

<sup>1</sup> Where necessary, values have been converted from Tunisian dinars (TD) to U.S. dollars (US\$) at an average rate of TD1.31=US\$1.00 for 2003 and TD1.41=US\$1.00 for 2002.

<sup>2</sup> References that include a section mark (§) are found in the Internet References Cited section.

Albidon Ltd. of Australia and BHP World Exploration Inc. (a subsidiary of the BHP Billiton group) continued evaluation of the Jebel Trozza zinc oxide and the Oued Belif copper-gold exploration permits. Albidon planned to conduct additional exploration in 2004 to follow up the 4-hole 736-meter reconnaissance drill program it began in November 2002 at Jebel Trozza.

Disappointing exploration results caused Aurora Metals Ltd. of the British Virgin Islands to return five exploration permits (the Aine Djonane Ed Dar, Henchir El Goussat, Koudiat ed Diss, Kordiat El Hamra, and Koudiat Sidi Amor permits) to High Marsh Holdings Ltd. of the British Virgin Islands in 2003. Aurora retained the El Hamri and Er Rosfa exploration permits on adjacent acreage in the Kebbouch District and the Hafs, Mena, Slima, and Zag et Tir exploration permits near Le Kef.

In February 2003, Consolidated Global Minerals Ltd. of Canada (which planned to acquire 100% equity interest in the properties from High Marsh Holdings) renewed the Ain Kemmala, Jebel Fej Lahdoun, and Kef El Adhama exploration permits in the Fej Lahdoun area. In 2002, Consolidated had renewed the Djebba, Koudiat El Louatia, and Ouled Moussa exploration permits.

### ***Industrial Minerals***

About 12 million metric tons (Mt) of raw phosphate rock was mined in 2003, primarily from Gafsa Phosphate Co.'s open pit mines, which included the Kef Eddour complex (3.2 Mt), Kef Eschfair Mine (3 Mt) and Jallabia facility (1.7 Mt). Underground production continued to be phased out; in 2003, it was limited to 148,000 t from the Redeyef Mine. In 2003, the processing plants increased washed phosphate rock production to 7,890,000 t, which was almost a 6% increase compared with 2002 output (Central Bank of Tunisia, 2004, p. 58).

### ***Mineral Fuels***

The Hydrocarbon Code (law No. 99-93 of August 17, 1999) regulated oil and gas exploration and production in Tunisia. In 2003, production of natural gas increased slightly, but crude oil production declined more than 9% from 2002 volumes. Successful oil wells drilled in 2003 included the Hawa-1 on the Borj el Khadra concession, which was operated by Agip Tunisia BV (50% equity interest) for joint venture partners Pioneer Natural Resources Tunisia Ltd. (40%) and Paladin Expro Ltd. (10%); and the CEM-1 and SEA-1 wells on the Anaguid Block, which was operated by Anadarko Tunisia Anaguid Co. The state-owned Entreprise Tunisienne d'Activités Pétrolières had the option to acquire 30% interest in the Borj el Khadra operation.

Société Tunisienne d'Electricité et de Gaz and National Oil Co. of Libya formed JointGas to build and manage a 2-billion-cubic-meter-per-year-capacity gas pipeline. The 275-kilometer pipeline will move Libyan natural gas from near Mellita, Libya, to consumers in the Gabes, Tunisia, area (Africa Energy Intelligence, 2003).

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### **Major Sources of Information**

Ministère de l'Industrie et de l'Energie (Ministry of Industry and Energy)  
Rue 8301 Immeuble Inozha Montplaisir  
1002, Tunis, Belvédère  
Tunisia  
Telephone: +(216-71) 791-132  
Fax: +(216-71) 782-742  
E-mail: [mind@ministeres.tn](mailto:mind@ministeres.tn)

Office National des Mines (National Mining Office)  
24, Rue 8601 LP 215  
Zone Industrielle Charguia  
2035, Tunis  
Tunisia  
Telephone: +(216-71) 796-527  
Fax: +(216-71) 794-016

TABLE 1  
TUNISIA: PRODUCTION OF MINERAL COMMODITIES <sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity <sup>2</sup>	1999	2000	2001	2002	2003 <sup>p</sup>
<b>METALS</b>					
Iron and steel:					
Iron ore:					
Direct shipping ore and concentrate, gross weight	219	182	204	198	164
Fe content	119	98	109 <sup>e</sup>	105	97
Metal:					
Pig iron	180	196	192	152	36
Steel, crude	229	237	239	200 <sup>r</sup>	86
Lead, mine output, Pb content metric tons	6,589	6,602	6,820 <sup>e</sup>	5,081	5,000
Silver metal, primary <sup>e</sup> kilograms	4,000	3,700	3,650	3,000	3,000
Zinc:					
Concentrate, gross weight metric tons	89,213	74,996	73,000	64,890	65,800
Zn content do.	49,066	41,247	37,900 <sup>r, e</sup>	35,692	36,000
<b>INDUSTRIAL MINERALS</b>					
Barite do.	530	3,702	2,208	5,539	3,000
Cement, hydraulic <sup>3</sup>	4,864	5,657	5,721	6,022	6,038
Clays, for construction and clay products	3,670	3,870	4,260	4,400	4,500
Fertilizers:					
Triple-superphosphate	812	805	783	796	875
Phosphoric acid	1,208	1,043	1,144	1,219	1,164
Diammonium-phosphate	1,048	1,113	1,124	1,315	1,324
Ammonium nitrate	172	182	170	127	164
Fluorine:					
Fluorspar, acid grade metric tons	520	--	--	--	--
Aluminum fluoride	39	43	44	39	45
Gypsum <sup>e, 4</sup>	110	125	125	125	110
Lime	475	517	467	471	446
Phosphate rock, washed:					
Gross weight	8,006	8,339	8,144	7,461 <sup>r</sup>	7,890
P <sub>2</sub> O <sub>5</sub> content <sup>e</sup>	2,400	2,500	2,440	2,240 <sup>r</sup>	2,370
Salt, marine	447	620	654	616	700
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Gas, natural:					
Gross million cubic meters	1,819	1,985	2,254	2,149	2,167
Dry <sup>e</sup> do.	1,450	1,600	1,800	1,700	1,750
Petroleum:					
Crude thousand 42-gallon barrels	30,960	28,207	26,300	26,800	24,300
Refinery products:					
Liquefied petroleum gas do.	1,288	1,279	1,180	1,310 <sup>r</sup>	1,200
Gasoline do.	3,096	3,301	3,690 <sup>r</sup>	3,380 <sup>r</sup>	3,600
Kerosene do.	1,194	1,216	1,560	1,590 <sup>r</sup>	1,270
Distillate fuel oil do.	3,812	4,010	3,490 <sup>r</sup>	3,500 <sup>r</sup>	3,780
Residual fuel oil do.	4,149	4,346	3,950 <sup>r</sup>	4,020	4,050
Other <sup>e</sup> do.	1,420	940	940 <sup>r</sup>	1,120 <sup>r</sup>	1,180
Total <sup>e</sup> do.	15,000	15,100	14,800 <sup>r</sup>	14,900 <sup>r</sup>	15,100

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>p</sup>Preliminary. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Data available as of September 15, 2004.

<sup>2</sup>In addition to the commodities listed, a variety of crude construction materials (sand and gravel and stone) was produced, but output was not reported, and available information was inadequate to make estimates of output.

<sup>3</sup>Includes white cement production, in thousand metric tons: 1999--192; 2000--250; 2001--247; 2002--259; and 2003--292.

<sup>4</sup>Does not include phosphatic gypsum (waste product) generated during fertilizer production.